

What is claimed is:

1. A method for inferring natural eye color of a human subject from a nucleic acid sample of the subject, comprising identifying in the nucleic acid sample at least one nucleotide occurrence of an eye color related single nucleotide polymorphism (SNP) of an oculocutaneous albinism II (OCA2) gene, wherein the SNP comprises:

nucleotide 426 of SEQ ID NO:1, wherein a G residue indicates an increased likelihood of a lighter eye shade;

nucleotide 497 of SEQ ID NO:2, wherein a T residue indicates an increased likelihood of a darker eye shade;

nucleotide 68 of SEQ ID NO:3, wherein a T residue indicates an increased likelihood of a darker eye shade;

nucleotide 171 of SEQ ID NO:4, wherein a T residue indicates an increased likelihood of a darker eye shade;

nucleotide 533 of SEQ ID NO:5, wherein a C residue indicates an increased likelihood of a darker eye shade;

nucleotide 369 of SEQ ID NO:6, wherein a C residue indicates an increased likelihood of a darker eye shade; or

nucleotide 509 of SEQ ID NO:7, wherein a C residue indicates an increased likelihood of a darker eye shade,

wherein the lighter eye shade comprises green or blue, and wherein the darker eye shade comprises brown or hazel, thereby inferring natural eye color of the subject.

2. The method of claim 1, which comprises identifying in the nucleic acid sample nucleotide occurrences of at least two eye color related SNPs of the OCA2 gene.

3. The method of claim 1, wherein the SNP comprises an eye color related haplotype allele.

4. The method of claim 1, further comprising identifying in the nucleic acid sample at least one nucleotide occurrence of an eye color related SNP of a tyrosinase-related protein 1 (TYRP1) gene, wherein the SNP comprises:

nucleotide 172 of SEQ ID NO:8, wherein a C residue indicates an increased likelihood of a darker eye shade;

nucleotide 181 of SEQ ID NO:9, wherein a G residue indicates an increased likelihood of a darker eye shade;

nucleotide 360 of SEQ ID NO:10, wherein a C residue indicates an increased likelihood of a darker eye shade.

5. The method of claim 1, further comprising identifying in the nucleic acid sample at least one nucleotide occurrence of an eye color related SNP comprising nucleotide 21 as set forth in any of SEQ ID NOS:26 to 36 and 37 to 48, or nucleotide 26 as set forth in SEQ ID NO:37.

6. The method of claim 1, wherein identifying at least nucleotide occurrence of an one eye color related SNP of an OCA2 gene in the nucleic acid sample comprises comparing a nucleotide occurrence of the eye color related SNP of the nucleic acid sample of the subject, with known nucleotide occurrences of eye color related SNPs associated with known eye colors.

7. The method of claim 6, wherein the known nucleotide occurrences of the eye color related SNPs associated with known eye colors are contained in a database.

8. The method of claim 7, wherein the comparing is performed using a computer.

9. The method of claim 6, wherein each of the known nucleotide occurrences of the eye color related SNPs associated with a known eye color is further associated with a photograph of a person from whom a known nucleotide occurrence was determined.

10. The method of claim 9, wherein the photograph comprises a digital photograph.

11. The method of claim 10, wherein digital information comprising the digital photograph is contained in a database.

12. The method of claim 9, further comprising identifying a photograph of a person having a known nucleotide occurrence corresponding to the nucleotide occurrence of the eye color related SNP identified in the nucleic acid sample of the subject.

13. The method of claim 12, wherein identifying the photograph comprises scanning a database comprising a plurality of files, each file comprising digital information corresponding to a digital photograph of a person having a known nucleotide occurrence of an eye color related SNP, and identifying at least one photograph of a person having a known nucleotide occurrence of an eye color related SNP associated with a known eye color that corresponds to a nucleotide occurrence of an eye color related SNPs identified in the nucleic acid sample of the subject.

14. An article of manufacture, comprising at least one photograph of a person having a known nucleotide occurrence of an eye color related SNP associated with a known eye color.

15. The article of claim 14, which is contained in a file.

16. A plurality of files comprising the article of manufacture of claim 14, wherein files of the plurality comprise at least one photograph of a person having a known nucleotide occurrence of an eye color related SNP associated with a known eye color.

17. The file of claim 16, which comprises a plurality of photographs, wherein photographs of the plurality comprise a photograph of a person having a known nucleotide occurrence of an eye color related SNP associated with a known eye color.

18. The file of claim 17, wherein photographs of the plurality comprise photographs of different persons having the same known eye colors.

19. The article of manufacture of claim 14, wherein the at least one photograph comprises a digital photograph.

20. The article of manufacture of claim 19, wherein the digital photograph comprises digital information.

21. A kit, comprising a plurality of hybridizing oligonucleotides, which comprise at least fifteen contiguous nucleotides of at least four polynucleotides as set forth in SEQ ID NOS:1 to 7, or polynucleotides complementary thereto.

22. The kit of claim 21, wherein the hybridizing oligonucleotides comprise at least fifteen contiguous nucleotides of at least four polynucleotides as set forth in SEQ ID NOS:1 to 10 and 26 to 48, or polynucleotides complementary thereto.

23. The kit of claim 21, wherein hybridizing oligonucleotides of the plurality comprise at least one probe, at least one primer, at least one primer pair, or a combination thereof.

24. A composition for inferring natural eye color of a human subject, comprising a specific binding pair member that selectively binds to a polynucleotide comprising a nucleotide occurrence of a SNP as set forth in any of SEQ ID NOS:1 to 7, or a polypeptide encoded thereby.

25. A method for inferring natural hair color of a human subject from a nucleic acid sample of the subject, comprising identifying in the nucleic acid sample at least one nucleotide occurrence of a hair color related single nucleotide polymorphism (SNP), wherein the SNP comprises:

nucleotide 177 of SEQ ID NO:11;

nucleotide 344 of SEQ ID NO:12;
nucleotide 24 of SEQ ID NO:13;
nucleotide 137 of SEQ ID NO:14;
nucleotide 169 of SEQ ID NO:15;
nucleotide 318 of SEQ ID NO:16;
nucleotide 122 of SEQ ID NO:17,
nucleotide 26 of SEQ ID NO:18;
nucleotide 220 of SEQ ID NO:19;
nucleotide 178 of SEQ ID NO:20;
nucleotide 26 of SEQ ID NO:21;
nucleotide 402 of SEQ ID NO:22;
nucleotide 146 of SEQ ID NO:23;
nucleotide 207 of SEQ ID NO:24; or
nucleotide 337 of SEQ ID NO:25;

wherein the nucleotide occurrence of the SNP is indicate of hair color, thereby inferring natural hair color of the subject.

26. The method of claim 25, comprising identifying at least two hair color related SNPs.

27. The method of claim 25, wherein the SNP comprises a hair color related haplotype allele.

28. A composition for inferring natural hair color of a human subject, comprising a specific binding pair member that selectively binds to a polynucleotide comprising a nucleotide occurrence of a SNP as set forth in any of SEQ ID NOS:11 to 25, or a polypeptide encoded thereby.